January 20, 1999

MEMORANDUM

SUBJECT: **Terbufos**. List A Reregistration Case No. 0109/Chemical ID No. 105001.
Revised Probabilistic (Monte Carlo) Dietary Exposure Analysis and Supporting
Documentation; Revised Chronic Dietary Exposure and Risk Analysis. MRID No.
44629301. DP Barcode Nos. D249385 and D250807.

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Background

American Cyanamid (AMCY) has provided the Agency with revised chronic and probabilistic
acute dietary exposure and risk analyses for terbufos (MRID No. 44629301, 8/5/98). In response
to a request from EPA and in support of the revised chronic and acute analyses, the registrant has
provided the Agency with additional information consisting of electronic residue distribution files
(RDFs), food codes used in Novigen's consumption database, detailed % crop treated
information, and MRID Nos. for data used in the analyses (submission dated 11/3/98). American
Cyanamid provided this information through Novigen Sciences, Inc. to revise the Agency's acute
and chronic dietary risk assessments for terbufos.

Present Considerations

HED has:

- Verified the inputs to AMCY's residue distribution files;
- Conducted a probabilistic acute dietary exposure analysis using the Dietary Exposure Evaluation Model™ (proprietary software for which EPA has a site license), incorporating the residue distribution files submitted by AMCY, DEEM™ default concentration factors, and the EPA accepted NOAEL for acute dietary risk assessment;
- Conducted additional probabilistic analyses to address the effect of potential mitigation options on acute dietary risk; and
- Revised the chronic dietary exposure and risk analysis using anticipated residues calculated by AMCY and verified by HED, and calculated chronic drinking water levels of comparison (DW$_{LOCs}$).

DISCUSSION

The residue distribution files submitted by AMCY are largely acceptable for use in Agency risk assessments; the submission was organized such that residue values used in the assessment were easily verified. However, HED made some changes in how blended commodities were treated and ran an in-house probabilistic assessment. The HED probabilistic analysis, conducted using AMCY RDFs (with the exception of blended commodities), the DEEM™ default concentration factors, and the EPA accepted NOAEL for acute dietary exposure, should be used for acute dietary risk assessment.

The HED assessment indicates acute dietary risk exceeds the Agency's level of concern for the general US population and various population subgroups; estimated margins of exposure (MOEs) ranged from 19 (non-nursing infants) to 160 (males, 20+), while an acceptable MOE is 300 or greater. The corresponding percent of the acute reference dose (aRfD) consumed ranged from 180 %aRfD (males, 20+) to 1540 %aRfD (non-nursing infants). Since dietary risk from food only was unacceptable, acute drinking water levels of comparison (DW$_{LOCs}$) could not be calculated. If residues in water were the only source of exposure (i.e., no exposure from food), the acute DW$_{LOCs}$ would be 0.60 ppb for the general population, and 0.17 ppb for infants and children.

HED conducted additional analyses using the same data set, excluding certain commodities from the exposure assessment. For example, one analysis included bananas and coffee (excluding corn), while another included corn and coffee (excluding bananas). [Since exposure to residues in coffee did not contribute significantly to acute dietary risk, the two assessments essentially demonstrated the acute dietary risk associated with either bananas or corn.] The results indicate that exposure to residues in bananas represents a more significant contribution to acute dietary risk than exposure to residues in corn. In order to further characterize the acute dietary risk for terbufos, additional analyses were conducted to determine if single extreme consumption events contributed to the high risk estimates. The results demonstrate that the high end exposure estimates for the most highly exposed population subgroups are largely based on residues

detected in banana field trials, rather than on consumption of excessive quantities of bananas by an individual. Individual consumption events selected from the distribution and reported in the analysis involved a maximum of slightly more than two peeled bananas per day, and most consumption events reported were approximately one peeled banana. In summary, HED concludes that bananas are a primary contributor to the high-end exposure values (>99.9 percentile) and that these high-end exposure do not result from unusual or extreme banana consumption values.

The revised assessment confirms that chronic dietary exposure/risk for terbufos is below the Agency's level of concern, with 4.5 to 26% of the chronic reference dose consumed by registered uses. Chronic drinking water levels of comparison (DW_{LOCs}) were determined to be 0.56 ppb for the general population, and 0.13 ppb for infants and children.

<u>CONCLUSIONS</u>

AMCY Acute (Monte Carlo) and Chronic Dietary Exposure/Risk Assessments

1. The dose proposed by AMCY for acute dietary risk assessment was not adopted by HED's Hazard Identification Assessment Review Committee (HIARC); therefore, the MOEs summarized in the study report cannot be used in the revised acute dietary risk assessment. However, exposure values generated for the US population and various population subgroups can be compared to the dose used by EPA for acute dietary risk assessment.

2. The reference dose used by AMCY in the chronic analysis was not adjusted to include the additional 3X safety factor retained by HED in accordance with FQPA. Therefore, exposure values generated by AMCY were compared to the FQPA-adjusted reference dose (RfD) of 0.000017 mg/kg/day.

3. The AMCY analyses (both acute and chronic) were completed using Novigen's Dietary Exposure Evaluation Model (DEEM™) software and consumption data from the USDA Continuing Survey of Food Intake by Individuals (CSFII), 1989-1992. The same software and consumption data are used by HED to perform acute and chronic dietary exposure analyses, and are considered acceptable for assessing dietary risk associated with terbufos uses.

4. Percent crop treated data used by AMCY are similar to OPP/BEAD estimates, and are therefore generally acceptable for use in the probabilistic acute dietary exposure analysis. The acute analysis was weighted to account for the percentage of imported bananas treated at the two 1X treatments rates (3 or 4 g ai/mat). The chronic anticipated residue was weighted similarly.

5. Default concentration factors included in the DEEM™ software were set to 1 in the

AMCY acute and chronic dietary risk analyses; in accordance with HED policy, the default concentration factors are to be retained in the absence of data. Since there are no data depicting the potential for concentration (or reduction) of terbufos residues in dried bananas, high fructose corn syrup and molasses, the acute dietary exposure analysis must be conducted using the default concentration factors included in DEEM™.

6.   HED concurs with AMCY's exclusion of beet sugar from the analyses since a sugar beet processing study conducted using a structurally similar pesticide, phorate, has shown the residues completely degrade during the liming and carbonation steps.

7.   HED concurs with AMCY's proposal to exclude sorghum from the analyses, since there was no reported consumption of sorghum products in the CSFII (1989-1992).

8.   Residue values and zeros incorporated into AMCY's residue distribution files for bananas and sweet corn were verified and deemed acceptable, including random checks of calculated residues which were detected but not quantifiable [i.e., between the limit of quantitation (LOQ) and the limit of detection (LOD)]; a summary of the residue distribution files is included in the detailed considerations. The anticipated residues for use in the chronic dietary risk assessment are also discussed.

9.   The AMCY use of a residue distribution file for corn (field and pop) in the acute analysis is not considered appropriate for a blended commodity. In the HED analysis, the average residue in corn was corrected for % crop treated, and included as a single residue value in the analysis.

10.   HED does not consider coffee to be a blended commodity; however, due to the apparent insignificant contribution of residues in coffee to dietary exposure/risk for terbufos, HED has no objection to the treatment of coffee as a blended commodity for the purposes of the acute dietary exposure analysis for terbufos. However, the use of a residue distribution file for a blended commodity is not appropriate. In the HED analysis, the average residue in coffee was corrected for % crop treated, and included as a single residue value in the analysis.

11.   AMCY concluded that based on the revised anticipated residues and probabilistic analysis, both chronic and acute dietary risk associated with terbufos uses are below the Agency's level of concern.

12.   Despite the level of refinement used in the analysis, acute dietary exposure determined by AMCY exceeds the Agency's level of concern (for the general US population and various population subgroups) when exposure at the 99.9th percentile is compared to the Agency's acute dietary NOAEL of 0.005 mg/kg/day. An acceptable MOE for acute dietary exposure is 300 or greater, but AMCY estimated Margins of Exposure (MOEs) for the current analysis ranged from 38 to 139.

13.   The AMCY revised chronic dietary exposure analysis indicates chronic dietary risk
        associated with terbufos uses is below the Agency's level of concern, with 2.9% to 13.1%
        of the RfD consumed. Chronic dietary risk, as determined in previous HED assessments
        and in previous and current AMCY submissions, is below the Agency's level of concern.

HED Probabilistic (Monte Carlo) Acute Dietary Risk Analyses

14.   HED conducted a probabilistic analysis using the AMCY-generated residue distribution
        files (with the exception of the blended commodities, corn and coffee), but retained the
        DEEM™ default concentration factors for bananas and corn. The results of the analysis
        were comparable to AMCY results, with MOEs ranging from 19 (non-nursing infants) to
        160 (males 20+).

15.   HED repeated the analysis using AMCY RDFs *excluding* bananas. Complete exclusion of
        banana commodities from the analysis (i.e., including only corn and coffee) resulted in
        estimated MOEs ranging from 100 (children 1-6) to 5000 (nursing infants) at the 99.9th
        percentile. Corresponding %aRfDs ranged from 6 %aRfD (nursing infants) to 290
        %aRfD (children 1-6).

16.   HED repeated the analysis using AMCY RDFs *excluding* corn (i.e., including only
        bananas and coffee). The resulting estimated MOEs ranged from 19 (non-nursing infants)
        to 170 (males 20+) at the 99.9th percentile. Corresponding %aRfDs ranged from 170
        %aRfD (males 20+) to 1540 %aRfD (non-nursing infants).

17.   The analyses in which certain commodities were excluded from the risk assessment
        indicate estimated exposure to residues in bananas contributes most significantly to acute
        dietary risk.

18.   A critical exposure contribution (CEC) analysis for exposures greater than 0.0001 or
        0.0002 mg/kg/day (approximately 600 or 1200 %aRfD) demonstrated that individual
        consumption events involved at most slightly more than 2 peeled bananas; most of the
        individual consumption events consisted of approximately 1 peeled banana. HED
        concludes that bananas are a primary contributor to the high-end exposure values (>99.9
        percentile) and that these high-end exposure do not result from unusual or extreme banana
        consumption values.

HED Revised Chronic Dietary Risk Analysis and Drinking Water Levels of Comparison

19.   HED conducted a revised chronic dietary risk analysis using the anticipated residues
        generated by AMCY, using BEAD %CT data, and incorporating the DEEM™ default
        concentration factors. Chronic dietary exposure and risk associated with uses on terbufos
        are below the Agency's level of concern, with 4.5 to 26 % of the reference dose (RfD)

consumed by registered uses.

20. The HED results were slightly higher than those reported by AMCY, due to the higher % crop treated used for some commodities, and due to the retention of default concentration factors.

21. The commodity contribution analysis indicates bananas contribute approximately 50% of the chronic risk for the general US population, and from 40% to 90% of the chronic dietary risk for infants/children. Exposure to residues in corn commodities contributes up to 60% of chronic dietary risk for children (7-12).

22. HED calculated chronic drinking water levels of comparison (DW_{LOCs}); for the general US population, the DW_{LOC} is 0.56 ppb. The DW_{LOC} for infants and children is 0.13 ppb.

DETAILED CONSIDERATIONS

Review of AMCY Chronic and Probabilistic Acute Dietary Exposure Assessment

Previous Actions

In the 10/23/95 HED RED Chapter for terbufos, acute dietary risk using the Dietary Risk Evaluation System (DRES, 1977/78 consumption data) was determined based on tolerances for commodities supported through reregistration. The margins of exposure (MOEs) were calculated to be between 10 and 50 for the general US population and various population subgroups; at that time, 100 was considered to be an acceptable MOE. The registrant conducted a probabilistic dietary exposure and risk analysis, which was deemed unacceptable. The current assessment consists of a revised probabilistic dietary exposure and risk analysis conducted by Novigen for American Cyanamid. The new analysis incorporates the Agency's draft policy regarding the use of the LOQ/LOD in risk assessments and additional corn and banana residue data. In addition, a revised chronic dietary risk analysis was conducted to incorporate the new residue data and revised anticipated residues.

Hazard Information

In response to the HED RED chapter, the registrant submitted an acute neurotoxicity study conducted in rats, which they believe to be the appropriate study for selecting an endpoint and NOAEL for acute dietary risk assessment [previously, the acute dietary endpoint (plasma cholinesterase inhibition) and NOAEL (0.005 mg/kg/day) were selected from a 28-day oral study in dogs]. The acute neurotoxicity study in rats was reviewed and deemed acceptable (E. Mendez review dated 11/05/98); HIARC considered its merit for risk assessment purposes, but concluded that the dog is the most sensitive species and that the 28-day dog study should continue to serve as the source of dose/endpoint for acute dietary risk assessment. As stated in the 4/6/98 RED

Chapter, the FQPA safety factor was reduced to 3X. The standard 100X to account for inter-species extrapolation and intra-species variability was also applied; the total uncertainty factor, and therefore acceptable MOE, was 300. The FQPA-adjusted acute reference dose (aRfD) is 0.000017 mg/kg/day.

Since the current probabilistic analysis did not compare dietary exposure to the NOAEL currently accepted by EPA, the MOEs summarized in the study report cannot be used in the Agency's risk assessment. However, the AMCY-generated exposure values were compared with the EPA-accepted NOAEL. To confirm the results of the probabilistic analysis, HED used the electronic RDF files and the DEEM™ software to complete a probabilistic analysis using the acute dietary endpoint/dose selected from the oral dog study (see below).

In AMCY's chronic dietary risk analysis, the additional safety factor of 3X was not applied to the reference dose (RfD). Therefore, HED used the exposure data to determine the % of the FQPA-adjusted RfD consumed by the registered uses, as calculated by AMCY. The FQPA-adjusted dose for chronic dietary risk is 0.000017 mg/kg/day.

Consumption Database

The AMCY analysis was completed using Novigen's Dietary Exposure Evaluation Model (DEEM™) software and consumption data from the USDA Continuing Survey of Food Intake by Individuals (CSFII), 1989-1992. Although the recipe translations for commodities included in the terbufos analysis were not submitted, the DEEM™ software and the Novigen translation of the 1989-1992 CSFII consumption data are currently being used in Agency risk assessments, and are therefore considered acceptable.

Use of Percent Crop Treated Information

The registrant's assessment incorporated percent crop treated (%CT) information obtained from Doane's Research Marketing (domestic use) and Landell Mill (import uses, banana and coffee). In addition, the registrant provided proprietary information pertaining to the percentage of banana acreage treated at a lower rate of 3 g ai/mat vs. the percentage treated at the higher rate of 4 g ai/mat; this information has been incorporated into the electronic RDF files for banana (refer to detailed discussion under "bananas"). The Agency's %CT assessment was based on the same sources, and the results of the two assessments are similar. A comparison of OPP/BEAD percent crop treated (%CT) information and %CT used in the AMCY analysis is shown in Table 1.

Table 1. Summary of %CT Data for Terbufos.

Commodity	OPP/BEAD Max. %CT	AMCY %CT
Bananas	26	28
Field Corn	11	7.8
Popcorn	11	7.8
Sweet Corn	9	7.5
Sorghum	4	4.2
Sugar Beet (Sugar)	37	37
Coffee	N/A[1]	0.3[2]

[1]   Since the time-limited tolerance for residues in coffee had expired when the HED RED Chapter was completed, the HED risk assessment did not include this use.

[2]   Rounded to 1% in the risk assessment.

HED generally requires registrants to use OPP/BEAD percent crop treated numbers in probabilistic analyses. For the purpose of the terbufos acute dietary risk assessment, HED concludes that since the Agency's and AMCY's assessments are similar, the AMCY %CT values are acceptable. Although AMCY %CT values were used in the AMCY chronic dietary risk analysis, the HED revised chronic dietary risk analysis incorporates OPP/BEAD %CT values (with the exception of bananas).

Processing Factors

The AMCY assessment did not include processing factors determined through processing studies submitted to EPA. Therefore, residues in processed commodities were assumed in the AMCY analysis to be the same as those in the RAC. The DEEM™ software contains default concentration factors based on moisture loss and volume changes during processing. Provided no additional information is given, HED policy is to use the default concentration in the analysis. In the AMCY analysis, all default concentration factors were set to 1 (i.e., no concentration). This is not acceptable. The default factors were 3.9X for dried bananas, and 1.5X for high fructose corn syrup and molasses.

Although there are no processing studies for sugar beets, the registrant cited a study conducted for the active ingredient phorate, which is structurally similar to terbufos. The study demonstrates that the liming and carbonation processes that typically occur during beet sugar manufacture degrade phorate residues. On this basis, AMCY proposes deleting sugar beet from the dietary exposure analyses for terbufos. HED concurs with this approach.

Residue Distribution Files

The registrant submitted electronic and written copies of the residue distribution files (RDFs) used in the probabilistic analysis. For all commodities, residue data submitted to the Agency were summarized in a table; residues actually used in the RDFs were clearly indicated. Each residue value was described as being one of the following: a residue detected in a field trial sample; ½ the limit of quantitation (½LOQ) for residues reported as such in field trials, and for which a limit of detection (LOD) was not determined; ½ the limit of detection (½LOD) for samples analyzed in studies which clearly defined an LOD; or the analyst's (AMCY) estimate for residues which were detectable but not quantifiable (i.e., between the LOD and the LOQ). A summary of the inputs to the residue distribution files is presented in Table 2, and individual commodities are discussed below; printouts of the RDFs are included in the appendices.

Bananas

New banana field trial data summarized in the 12/23/98 C. Swartz memo were incorporated into the AMCY dietary exposure analysis. Using older data as well as more recent field trials, a total of 54 data points ranging from <LOD (0.0002 ppm for the new analytical method) to a maximum of 0.016 ppm were used. For samples in which residues were detected in the whole banana but were never quantified in the pulp, a ratio of pulp:whole banana residues was calculated from other banana field trial data in which both pulp and whole banana residues were quantified (6 data points, average ratio of 0.8, maximum ratio of 1). In previously submitted field trials, residues in pulp were not quantified when residues in the whole banana were not detectable; for these samples, either ½ LOQ or ½ LOD for whole bananas was used. Many of the samples from the 1997 field trials had residues between the LOD and the LOQ. Random residue values were verified by HED by looking at raw data and chromatograms; all of these values were accurate, and HED has no reason to doubt the validity of the remainder. For samples from previous trials, the registrant did not attempt to calculate residues between the LOD and LOQ, but simply used ½ LOQ in the probabilistic analysis.

A total of 14 data points were available from the 3 g ai/mat application rate, while 40 data points were available from studies in which the 4 g ai/mat application rate was used. The registrant weighted the inputs to the residue distribution file to account for 0.3% of banana imports being treated at 4 g ai/mat, and 27% of banana imports treated at 3 g ai/mat. The weighting was accomplished by counting each residue from the 3 g ai/mat rate 250 times, counting each residue from the 4 g ai/mat one time, and adding in a total of 9,231 zeros. The AMCY percent crop treated information has not yet been verified by OPP/BEAD; however, since the residue values from the 3 g ai/mat applications exceeded those determined from the 4 g ai/mat applications (largely due to the higher LOD/LOQ of the older analytical method, but also due to actual residues detected), the registrant's method of weighting the residue values is considered to be conservative. In addition, the weighting of the data accounts for the use of different application rates used in the various countries exporting bananas to the U.S.

Since the same residue data were used in the chronic dietary risk analysis, AMCY calculated a weighted average residue level for bananas, 0.007 ppm. HED verified this anticipated residue using the submitted data, and used it in the revised chronic dietary risk analysis.

Corn (Field and Pop)

New field corn residue data summarized in the 12/23/98 C. Swartz memo were incorporated into AMCY's residue distribution files. Although numerous corn field trials had been conducted since 1972, only a total of 61 data points were from field trials conducted at rates ranging from 1 to 1.6 lb ai/A (the current maximum use rate is 1.3 lb ai/A). In samples from the 1994 to 1996 field trials, residue values between the LOD and the LOQ were calculated by AMCY. HED verified some of these values at random using the raw data submitted with the study report in concert with representative chromatograms; all of these values were accurate, and HED has no reason to doubt the validity of the remainder. Many of the other samples appeared to have been reported as <LOD, in which case ½ LOD was used; the reported LODs seemed somewhat variable, ranging from 0.001 to 0.009.

The registrant averaged the field residue data to obtain an anticipated residue of 0.003 ppm in field corn and popcorn. The AMCY value of 8 %CT was used in the Monte Carlo analysis by constructing a RDF containing the value of 0.003 a total of 8 times and a total of 92 zeros to account for untreated corn. This approach is not acceptable for a blended commodity. The HED analysis used the anticipated residue (0.003 ppm), corrected for %CT, as a single point in the acute analysis. The same anticipated residue was used for corn (field and pop) commodities in the chronic dietary risk analysis.

Sweet Corn

Residue data submitted in 1972-1974 were used in the analysis. Although numerous field trials were conducted, only 14 data points are available at rates ranging from 1 to 1.3 lb ai/A, the maximum 1X rate. Out of 14 data points, 13 were nondetects, and were reported as ½ LOD, while one sample contained residues between the LOD and the LOQ, which the registrant calculated using raw data. The sweet corn residue distribution file included 14 data points and 167 zeros to account for 8 %CT. The average (anticipated) residue in sweet corn, determined by AMCY and verified by HED, is 0.006 ppm.

Sugar Beet

In conjunction with reregistration data requirements, HED has concluded that no additional data are required to support use on sugar beets. The available data were summarized in the AMCY submission; no residue distribution files were prepared, since residues are believed to be completely degraded upon processing into beet sugar, and since there are no other sugar beet commodities associated with dietary exposure to terbufos. Sugar beets were also excluded from the AMCY chronic dietary risk analysis.

Sorghum

Adequate residue data have been submitted to support the use on sorghum. The available data were summarized in the AMCY submission, but were not incorporated into the acute dietary exposure assessment, since there was no consumption reported for sorghum in the 1989-1992 CSFII. Sorghum was also excluded from the AMCY chronic dietary risk analysis.

Coffee

Since AMCY is interested in supporting the use on coffee, available coffee residue data were considered. A total of 8 data points were available, following applications ranging from 0.75 to 1.5 g ai/plant, with a maximum 1X rate of 1 g ai/plant. Residues were detected in only 1 of 8 samples, at the LOQ of 0.05 ppm; the other 7 residues were <0.05 ppm, and were incorporated into the assessment at ½ LOQ. AMCY proposes treating coffee as a blended commodity. Although HED does not consider coffee to be a blended commodity, based on available information, it does not appear that the risk associated with the use on coffee is significant when compared with dietary risk associated with use on bananas and corn. Therefore, HED does not object to treatment of coffee as a blended commodity for the purpose of this risk assessment.

The AMCY analysis incorporated coffee data into a residue distribution file, with 99 zeros and one value of 0.028 ppm (the average residue value). However, this approach is not acceptable for a blended commodity. The HED analysis used a single value consisting of the average residue corrected for %CT (1%). The average residue calculated by AMCY, which has been verified by HED, was also used in the HED chronic analysis.

Other Data

No data from USDA's Pesticide Data Program (PDP), FDA monitoring data, or any other market basket data were used in the AMCY assessment.

Table 2. Summary of Terbufos RDF Files Submitted by AMCY and Revised Anticipated
Residues for Chronic Risk Analysis.

Commodity	MRID Nos.	1X Rate	AMCY %CT	# Residue Values Used in RDF/ Anticipated Residue (ppm)	# Zeros	Total # of Values in RDF
Bananas	262634 44629302	3 g ai/mat	27.3	14 (x 250)[1]/ 0.007[2] 40 (x 1)	9231	12,771
		4 g ai/mat	0.3			
Field Corn	44629303, 41955604, 00036238, 00035963, 00035962, 232258, 091452 GS0109001	1.3 lb ai/A	8	8 (x 1)/0.003 [Note, the HED analysis did not use an RDF file, since corn is blended; a single point estimate of 0.00024 was used]	92	100
Sweet Corn	43237802	1.3 lb ai/A	8	14/0.006	167	181
Sugar Beets	42267901, 41569401, 0036214	4.35 lb ai/A	37	NA	NA	NA
Grain Sorghum	42661801, 41569402	3.92	4	N/A	N/A	N/A
Coffee	40365901	1 g ai/plant	1	1/0.028[3] [Note, the HED analysis did not use an RDF, since coffee was treated as a blended commodity; a single point estimate of 0.00028 ppm was used]	99	100

[1]   In order to account for the percentage of imported bananas treated at the 2 different 1X rates, residue
values for bananas treated at the lower rate were weighted by counting each value 250 times in the residue
distribution file.

[2]   The anticipated residue of 0.007 ppm is a weighted average calculated by AMCY.

[3]   HED does not consider coffee to be a blended commodity; however, due to the relatively insignificant
contribution of residues in coffee to dietary risk, HED has no objection to the treatment of coffee as a
blended commodity for this analysis only.

Results

AMCY concluded that based on the proposed NOAEL for acute dietary risk assessment, revised anticipated residues and probabilistic analysis, both chronic and acute dietary risk associated with terbufos uses are below the Agency's level of concern.

The 99.9th percentile acute dietary exposure values generated by AMCY using the residue data described above ranged from 0.000036 mg/kg/day (women 13+) to 0.000131 mg/kg/day (children 1-6). When these exposure values are compared with the Agency's NOAEL of 0.005 mg/kg/day, the resulting estimated Margins of Exposure (MOEs) range from 38 to 140 [equivalent to 210 to 700% of the FQPA-adjusted acute dose consumed]. Since an acceptable MOE is currently considered to be 300 or greater, the Agency's level of concern for acute dietary exposure and risk is exceeded, despite the level of refinement used in the analysis.

AMCY also estimated chronic dietary exposure and risk for terbufos, using the anticipated residues determined from available residue data as discussed above. The resulting percent of the RfD consumed by registered uses and coffee, as calculated by HED from AMCY results, ranged from 2.9% to 13.1% of the FQPA-adjusted RfD (0.000017 mg/kg/day, based on a NOAEL of 0.005 mg/kg/day and a combined UF of 300). Chronic dietary risk determined in previous HED assessments and in the current AMCY submission is below the Agency's level of concern.

HED Probabilistic Acute Dietary Exposure Analysis

In order to verify the results of the registrant's probabilistic dietary exposure analysis, with the correct treatment of blended commodities, and in order to include DEEM™ default concentration factors, HED conducted a probabilistic dietary exposure analysis using AMCY residue distribution files (RDFs) submitted electronically. Resulting estimated exposure values were compared to the acute NOAEL of 0.005 mg/kg/day to obtain margins of exposure (MOEs) for the general US population and various population subgroups. Results were also expressed in terms of the percentage of the FQPA-adjusted acute dose consumed (aRfD, 0.000017 mg/kg/day). In addition, HED conducted probabilistic dietary risk analyses first excluding bananas, and then excluding corn, in order to determine the potential impact of mitigation options on estimated dietary exposure/risk.

The results of AMCY's acute dietary risk analysis (using AMCY-generated exposure values and the EPA accepted NOAEL for acute dietary risk assessment), as well as the HED acute dietary risk analyses described above, are presented in Table 3. Based on both AMCY and HED analyses, acute dietary risk exceeds the Agency's level of concern for the general US population and various population subgroups. The analyses in which certain commodities were excluded indicate that estimated exposure to residues in bananas contributes most significantly to acute dietary risk for terbufos.

Table 3. Summary of Probabilistic (Monte Carlo) Acute Dietary Risk Analyses Conducted by AMCY and HED.
Results based on the 99.9th percentile
[FQPA-adjusted aRfD = 0.000017 mg/kg/day; Acceptable MOE = 300]

Population Subgroup	AMCY Analysis[1]			HED Analysis using AMCY RDFs[2]			HED Analysis, excluding bananas[3]			HED Analysis, excluding corn[4]		
	Exposure	%aRfD	MOE	Exposure	%aRfD	MOE	Exposure	%aRfD	MOE	Exposure	%aRfD	MOE
General US	0.000059	350	85	0.000068	400	74	0.000021	130	240	0.000065	380	77
All infants	0.000107	630	47	0.000255	1500	20	0.000010	57	500	0.000254	1500	20
Infants, nursing	0.000051	300	98	0.000131	770	38	0.000001	6	5000	0.000127	740	39
Infants, n-nursing	0.000113	660	44	0.000261	1540	19	0.000014	81	360	0.000262	1540	19
Children (1-6)	0.000131	770	38	0.000141	830	35	0.000049	290	100	0.000133	780	38
Children (7-12)	0.000069	410	72	0.000068	400	74	0.000033	190	150	0.000061	360	81
Females (13-50)	0.000036	210	140	0.000035	210	140	0.000015	91	330	0.000034	200	147
Males (20+ years)	n/a	n/a	n/a	0.000031	180	160	0.000015	87	330	0.000029	170	170

[1]   The exposure values generated in the AMCY analysis are presented, and compared to the EPA accepted aRfD and NOAEL. Note that the AMCY analysis set the DEEM™ default concentration factors to 1 (i.e., no concentration), which is not in accordance with HED policy.

[2]   The HED analysis used AMCY residue distribution files (RDFs), with the exception of field corn and coffee, DEEM™ default concentration factors for dried bananas, high fructose corn syrup and molasses, and compared the results to the EPA accepted NOAEL and aRfD.

[3]   The HED analysis excluded bananas and plantains (i.e., included only corn and coffee) and used DEEM™ default concentration factors (see footnote 2), and compared the results to the EPA accepted NOAEL and aRfD.

[4]   The HED analysis excluded corn commodities (i.e. included only bananas and coffee) using the AMCY RDF for bananas, a point estimate for coffee, and DEEM™ default concentration factors (see footnote 2); resulting exposures were compared to the EPA accepted NOAEL and aRfD.

In order to further characterize the acute dietary risk for terbufos, the acute dietary risk analysis for all commodities was conducted a second time, but using the DEEM™ software to complete a critical exposure contribution (CEC) analysis. The purpose of doing the analysis was to determine if single extreme consumption events contributed to the high risk estimates. The analysis indicates that the high end exposure estimates for the most highly exposed population subgroups, infants and children 1-6, are largely based on the detectable residues measured in banana field trials, rather than on consumption of large quantities of bananas by an individual. For exposures greater than 0.0001 or 0.0002 mg/kg/day (approximately 600 or 1200 %aRfD), individual consumption events selected from the distribution and reported in the analysis involved at most 240 g of bananas, or slightly more than 2 peeled bananas. Most consumption events reported were closer to 114 g, or 1 peeled banana.

Although acute drinking water levels of comparison (DW_{LOCs}) could not be calculated (since acute dietary risk exceeds the Agency's level of concern), HED notes that if there were no acute dietary exposure to terbufos through food, acute DW_{LOCs} would be 0.60 ppb for the general population, and 0.17 ppb for infants and children.

HED Chronic Dietary Exposure/Risk Analysis

Based on the AMCY anticipated residues verified by HED (see Table 2 for anticipated residues), a revised chronic dietary exposure and risk analysis was conducted, so that chronic drinking water levels of comparison (DW_{LOCs}) could be calculated for EFED. Note that the HED chronic analysis incorporated OPP/BEAD % CT information, with the exception of bananas, for which the AMCY weighted value was used (see Table 1), and included the DEEM™ default concentration factors. The results of the chronic dietary risk analysis are shown in Table 4, and the DEEM™ analysis is included as an appendix.

Table 4. HED Revised Chronic Dietary Risk Analysis.
[Chronic FQPA-Adjusted RfD = 0.000017 mg/kg/day]

Population Subgroup	Exposure (mg/kg/day)	% RfD	DW$_{LOC}$ (ppb)[1]
US Population	0.000001	6.6	0.56
All infants	0.000004	21	0.13
Nursing infants	0.000002	9.2	
Non-nursing infants	0.000004	26	
Children 1-6	0.000003	17	
Children 7-12	0.000002	9.5	
Females 13-50	0.000001	4.5	0.48
Males 20+	0.000001	4.5	0.56

[1]   The drinking water levels of comparison (DW$_{LOCs}$) were calculated using the following formula:

$$DW_{LOC} \text{ (chronic, ug/L)} = \frac{[(RfD - \text{chronic food exposure from DEEM}^{TM}) \times \text{body weight (kg)}}{\text{consumption (L)} \times 0.001 \text{ mg/ug}}$$

Where: body weight = 70 kg for males, 60 kg for females, 10 kg for children/infants
Consumption = 2 L for adults, 1 L for children/infants

The results of the chronic dietary exposure analysis indicate chronic dietary risk remains below the Agency's level of concern. The HED estimates of chronic dietary risk were slightly higher than those reported by AMCY, largely due to the higher % crop treated used by HED and the retention of default concentration factors. Based on a commodity distribution analysis, bananas contribute approximately 50% of the estimated chronic risk for the general US population, and from 40% to 90% of the chronic dietary risk for infants/children. Estimated exposure to residues in corn commodities contributes up to 60% of chronic dietary risk for children (7-12).

Attachments:

Appendix 1:   AMCY Residue Distribution Files (RDFs) for Bananas, Field Corn, Sweet Corn and Coffee.
Appendix 2:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs and DEEM™ Software.

cc: Reviewer, C. Swartz; List A File, DRES Files (M. Sahafeyen, HED/7509C)
CSwartz:RRB1:CM2:Rm 732B:703 305 5877:12/29/98
Secondary Review: DEEMSAC review:01/13/99
                     David J Miller:01/05/99

Appendix 1:   AMCY Residue Distribution Files (RDFs) for Bananas, Field Corn, Sweet Corn, and Coffee.

Bananas

Nonnormalized field trials - bananas (half lod/loq)
adj for 3 g ai and 4 g ai rates
totalz=9231

250,0.016	1,0.00022	1,0.00023
250,0.01	1,0.00028	1,0.00024
250,0.005	1,0.0002	1,0.00062
250,0.005	1,0.0001	1,0.0008
250,0.015	1,0.0001	1,0.00061
250,0.005	1,0.0001	1,0.00051
250,0.005	1,0.00041	1,0.0001
250,0.005	1,0.00044	1,0.0001
250,0.005	1,0.00034	1,0.0001
250,0.005	1,0.00052	1,0.0001
250,0.005	1,0.00024	1,0.0001
250,0.005	1,0.00023	1,0.0001
250,0.005	1,0.00019	1,0.0002
250,0.005	1,0.00022	1,0.0001
1,0.005	1,0.0001	1,0.00047
1,0.005	1,0.00022	1,0.00041
1,0.005	1,0.0001	1,0.00039
1,0.011	1,0.0001	1,0.00037

Field Corn

CORN, field 8% CT (add'l
trials and 1/2LOD/loq)
Totalz = 92
Totalnz = 8

0.003	0.003	0.003
0.003	0.003	0.003
0.003	0.003	

[Note: Since field corn has been treated as a blended commodity, HED recommends using a value of 0.003 x (0.08, %CT) for an anticipated residue of 0.00024 ppm in the acute analysis. The HED analysis did not use the AMCY RDF for field corn.]

Appendix 1:   AMCY Residue Distribution Files (RDFs) for Bananas, Field Corn, Sweet Corn,
                and Coffee.

Sweet Corn

CORN, SWEET 8% CT (LODs 1X applic only)
Totalz = 167
Totalnz = 14

0.0045	0.005	0.0025
0.005	0.01	0.002
0.005	0.005	0.0025
0.004	0.025	0.0025
0.0035	0.0025	

Coffee

Coffee - 1% CT
totalnz = 1
TOTALZ = 99

0.028

[Note: Since coffee has been treated as a blended commodity, HED recommends using a value of
0.028 x (0.01, %CT) for an anticipated residue of 0.00028 ppm in the acute analysis. The HED
analysis did not use the AMCY RDF for coffee.]

Appendix 2.   HED Probabilistic Acute Dietary Risk Analysis, Using AMCY RDFs and
              DEEM™ Software.

```
U.S. Environmental Protection Agency                         Ver. 6.08
DEEM Acute analysis for TERBUFOS                             1989/92 data
Residue file name: C:\DRESSAC\105001c.R91      Adjustment factor #2 NOT used.
Analysis Date 01-04-1999          Residue file dated: 01-04-1999/14:06:10/8
Reference dose (aRfD, Acute) .000017 mg/day
Comment:using MC data files from AmCy
--------------------------------------------------------------------------
RDF indices and file names for Monte Carlo Analysis
  1  C:\DRESSAC\Nnftban.rdf
  2  C:\DRESSAC\Swtcorn.rdf

Food Crop                                  RESIDUE   RDF  Adj.Factors
Code  Grp  Food Name                       (ppm)      #    #1     #2
----  ----  -------------------------     ---------  ---  ------ ------
 072  A    BANANAS                        000.016000  1   01.000 01.000
 073  A    BANANAS-DRIED                  000.016000  1   03.900 01.000
 094  A    PLANTAINS-RIPE                 000.016000  1   01.000 01.000
 112  A    COFFEE                         000.000028      01.000 01.000
 237  0    CORN/POP                       000.000024      01.000 01.000
 238  0    CORN/SWEET                     000.025000  2   01.000 01.000
 266  0    CORN GRAIN-ENDOSPERM           000.000024      01.000 01.000
 267  0    CORN GRAIN-BRAN                000.000024      01.000 01.000
 268  0    CORN GRAIN/SUGAR/HFCS          000.000024      01.500 01.000
 289  0    CORN GRAIN-OIL                 000.000024      01.000 01.000
 378  A    BANANAS-JUICE                  000.016000  1   01.000 01.000
 388  0    CORN GRAIN/SUGAR-MOLASSES      000.000024      01.500 01.000
 481  A    PLANTAINS-DRIED                000.016000  1   03.900 01.000


U.S. Environmental Protection Agency                         Ver. 6.27
DEEM ACUTE analysis for TERBUFOS                             (1989-92 data)
Residue file name: 105001c.R91                 Adjustment factor #2 NOT used.
Analysis Date: 01-04-1999/15:33:15   Residue file dated: 01-04-1999/14:06:10/8
Acute Reference Dose (aRfD) =   0.000017 mg/kg body-wt/day
MC iterations = 1000     MC list in residue file     MC seed =  1026
Run Comment: using MC data files from AmCy; modified to treat corn and coffee
as blended commodities; includes DEEM defaults
================================================================================


U.S. pop - all seasons          Daily Exposure Analysis 1/
---------------------            (mg/kg body-weight/day)
                                  per Capita    per User
                                 -----------   -----------
                 Mean             0.000001      0.000001
                 Standard Deviation  0.000005   0.000005
                 Percent of aRfD     4.05         4.09

       Percent of Person-Days that are User-Days = 99.15%


   Estimated percentile of user-days exceeding calculated exposure
    in mg/kg body-wt/day and corresponding percent of aRfD

  Percentile  Exposure   % aRfD      Percentile  Exposure   % aRfD
  ----------  ---------- ---------   ----------  ---------- ---------
     90.00    0.000000    0.03          10.00    0.000000    0.57
     80.00    0.000000    0.05           5.00    0.000001    5.00
```

Appendix 2.   HED Probabilistic Acute Dietary Risk Analysis, Using AMCY RDFs and
              DEEM™ Software.

70.00	0.000000	0.08	2.50	0.000008	47.02
60.00	0.000000	0.10	1.00	0.000018	105.46
50.00	0.000000	0.14	0.50	0.000028	167.47
40.00	0.000000	0.18	0.25	0.000041	241.30
30.00	0.000000	0.23	0.10	0.000069	403.23
20.00	0.000000	0.32			

U.S. Population (cont'd)

  Estimated percentile of per-capita days exceeding calculated exposure
    in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD	Percentile	Exposure	% aRfD
90.00	0.000000	0.03	10.00	0.000000	0.57
80.00	0.000000	0.05	5.00	0.000001	4.97
70.00	0.000000	0.08	2.50	0.000008	46.67
60.00	0.000000	0.10	1.00	0.000018	105.13
50.00	0.000000	0.13	0.50	0.000028	166.94
40.00	0.000000	0.17	0.25	0.000041	240.67
30.00	0.000000	0.23	0.10	0.000068	402.31
20.00	0.000000	0.32			

1/ Analysis based on all three-day participant records in CSFII 1989-92 survey.

All infants (<1 year)	Daily Exposure Analysis	
	(mg/kg body-weight/day)	
	per Capita	per User
Mean	0.000003	0.000005
Standard Deviation	0.000018	0.000023
Percent of aRfD	17.45	29.42

      Percent of Person-Days that are User-Days = 59.31%

  Estimated percentile of user-days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD	Percentile	Exposure	% aRfD
90.00	0.000000	0.03	10.00	0.000004	21.67
80.00	0.000000	0.09	5.00	0.000029	171.74
70.00	0.000000	0.17	2.50	0.000077	454.29
60.00	0.000000	0.20	1.00	0.000095	556.07
50.00	0.000000	0.30	0.50	0.000156	919.48
40.00	0.000000	0.50	0.25	0.000237	1393.46
30.00	0.000000	0.74	0.10	0.000271	1591.51
20.00	0.000000	1.13			

  Estimated percentile of per-capita days exceeding calculated exposure
    in mg/kg body-wt/day and corresponding percent of aRfD

Appendix 2.   HED Probabilistic Acute Dietary Risk Analysis, Using AMCY RDFs and
              DEEM™ Software.

Percentile	Exposure	% aRfD	Percentile	Exposure	% aRfD
90.00	0.000000	0.00	10.00	0.000001	7.58
80.00	0.000000	0.00	5.00	0.000012	68.78
70.00	0.000000	0.00	2.50	0.000044	260.43
60.00	0.000000	0.00	1.00	0.000087	509.52
50.00	0.000000	0.07	0.50	0.000114	670.15
40.00	0.000000	0.18	0.25	0.000182	1068.26
30.00	0.000000	0.29	0.10	0.000255	1500.92
20.00	0.000000	0.65			

Appendix 2.   HED Probabilistic Acute Dietary Risk Analysis, Using AMCY RDFs and
DEEM™ Software.

```
Nursing infants (<1 year)        Daily Exposure Analysis
------------------------         (mg/kg body-weight/day)
                                  per Capita    per User
                                 -----------   -----------
              Mean                0.000001      0.000003
              Standard Deviation  0.000009      0.000013
              Percent of aRfD        7.77         17.07

      Percent of Person-Days that are User-Days = 45.55%


   Estimated percentile of user-days exceeding calculated exposure
    in mg/kg body-wt/day and corresponding percent of aRfD
```

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000000	0.47
80.00	0.000000	0.11		5.00	0.000024	138.91
70.00	0.000000	0.15		2.50	0.000040	232.83
60.00	0.000000	0.16		1.00	0.000069	408.72
50.00	0.000000	0.18		0.50	0.000112	658.43
40.00	0.000000	0.19		0.25	0.000131	771.96
30.00	0.000000	0.22		0.10	0.000132	774.67
20.00	0.000000	0.30				

```
   Estimated percentile of per-capita days exceeding calculated exposure
     in mg/kg body-wt/day and corresponding percent of aRfD
```

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000000	0.28
80.00	0.000000	0.00		5.00	0.000000	0.46
70.00	0.000000	0.00		2.50	0.000021	125.38
60.00	0.000000	0.00		1.00	0.000046	268.53
50.00	0.000000	0.00		0.50	0.000068	397.25
40.00	0.000000	0.02		0.25	0.000108	634.02
30.00	0.000000	0.16		0.10	0.000131	772.51
20.00	0.000000	0.19				

```
Non-nursing infants (<1 yr)      Daily Exposure Analysis
-------------------------        (mg/kg body-weight/day)
                                  per Capita    per User
                                 -----------   -----------
              Mean                0.000004      0.000006
              Standard Deviation  0.000020      0.000025
              Percent of aRfD       21.52         33.05

      Percent of Person-Days that are User-Days = 65.10%


   Estimated percentile of user-days exceeding calculated exposure
    in mg/kg body-wt/day and corresponding percent of aRfD
```

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD

Appendix 2.   HED Probabilistic Acute Dietary Risk Analysis, Using AMCY RDFs and
            DEEM™ Software.

90.00	0.000000	0.04	10.00	0.000005	26.53
80.00	0.000000	0.10	5.00	0.000029	172.20
70.00	0.000000	0.17	2.50	0.000081	473.94
60.00	0.000000	0.27	1.00	0.000110	647.71
50.00	0.000000	0.48	0.50	0.000201	1179.65
40.00	0.000000	0.71	0.25	0.000242	1425.29
30.00	0.000000	0.98	0.10	0.000272	1598.27
20.00	0.000000	1.28			

Non-Nursing Infants (<1 year), cont'd.

Estimated percentile of per-capita days exceeding calculated exposure
  in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD	Percentile	Exposure	% aRfD
90.00	0.000000	0.00	10.00	0.000002	12.99
80.00	0.000000	0.00	5.00	0.000016	94.10
70.00	0.000000	0.00	2.50	0.000053	312.18
60.00	0.000000	0.03	1.00	0.000100	585.60
50.00	0.000000	0.12	0.50	0.000152	894.48
40.00	0.000000	0.25	0.25	0.000220	1293.60
30.00	0.000000	0.57	0.10	0.000261	1536.45
20.00	0.000000	0.96			

Children (1-6 years)	Daily Exposure Analysis	
--------------------	(mg/kg body-weight/day)	
	per Capita	per User
	-----------	-----------
Mean	0.000002	0.000002
Standard Deviation	0.000011	0.000011
Percent of aRfD	11.03	11.05

Percent of Person-Days that are User-Days = 99.89%

Estimated percentile of user-days exceeding calculated exposure
 in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD	Percentile	Exposure	% aRfD
90.00	0.000000	0.08	10.00	0.000000	1.16
80.00	0.000000	0.15	5.00	0.000005	29.67
70.00	0.000000	0.23	2.50	0.000026	151.18
60.00	0.000000	0.30	1.00	0.000048	280.15
50.00	0.000000	0.37	0.50	0.000074	436.44
40.00	0.000000	0.46	0.25	0.000104	610.81
30.00	0.000000	0.57	0.10	0.000141	830.15
20.00	0.000000	0.73			

Estimated percentile of per-capita days exceeding calculated exposure
  in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD	Percentile	Exposure	% aRfD

Appendix 2.   HED Probabilistic Acute Dietary Risk Analysis, Using AMCY RDFs and DEEM™ Software.

90.00	0.000000	0.08	10.00	0.000000	1.16
80.00	0.000000	0.15	5.00	0.000005	29.63
70.00	0.000000	0.22	2.50	0.000026	151.04
60.00	0.000000	0.30	1.00	0.000048	280.05
50.00	0.000000	0.37	0.50	0.000074	436.26
40.00	0.000000	0.46	0.25	0.000104	610.61
30.00	0.000000	0.57	0.10	0.000141	829.99
20.00	0.000000	0.73			

Appendix 2.   HED Probabilistic Acute Dietary Risk Analysis, Using AMCY RDFs and
              DEEM™ Software.

```
Children (7-12 years)              Daily Exposure Analysis
---------------------              (mg/kg body-weight/day)
                                    per Capita    per User
                                   -----------   -----------
                Mean                0.000001      0.000001
                Standard Deviation  0.000005      0.000005
                Percent of aRfD        4.96          4.97

       Percent of Person-Days that are User-Days = 99.78%
```

```
 Estimated percentile of user-days exceeding calculated exposure
  in mg/kg body-wt/day and corresponding percent of aRfD
```

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.08		10.00	0.000000	0.79
80.00	0.000000	0.14		5.00	0.000001	3.64
70.00	0.000000	0.19		2.50	0.000011	65.83
60.00	0.000000	0.23		1.00	0.000023	133.27
50.00	0.000000	0.29		0.50	0.000034	201.08
40.00	0.000000	0.36		0.25	0.000051	301.73
30.00	0.000000	0.43		0.10	0.000068	398.77
20.00	0.000000	0.54				

```
 Estimated percentile of per-capita days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD
```

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.08		10.00	0.000000	0.79
80.00	0.000000	0.14		5.00	0.000001	3.63
70.00	0.000000	0.19		2.50	0.000011	65.69
60.00	0.000000	0.23		1.00	0.000023	133.17
50.00	0.000000	0.29		0.50	0.000034	200.93
40.00	0.000000	0.35		0.25	0.000051	301.51
30.00	0.000000	0.43		0.10	0.000068	398.63
20.00	0.000000	0.54				

```
Females (13-50 years)              Daily Exposure Analysis
---------------------              (mg/kg body-weight/day)
                                    per Capita    per User
                                   -----------   -----------
                Mean                0.000000      0.000000
                Standard Deviation  0.000003      0.000003
                Percent of aRfD        2.54          2.55

       Percent of Person-Days that are User-Days = 99.63%
```

```
 Estimated percentile of user-days exceeding calculated exposure
  in mg/kg body-wt/day and corresponding percent of aRfD
```

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD

Appendix 2.   HED Probabilistic Acute Dietary Risk Analysis, Using AMCY RDFs and
                 DEEM™ Software.

Percentile	Exposure	% aRfD	Percentile	Exposure	% aRfD
90.00	0.000000	0.02	10.00	0.000000	0.36
80.00	0.000000	0.04	5.00	0.000000	0.66
70.00	0.000000	0.07	2.50	0.000006	35.79
60.00	0.000000	0.09	1.00	0.000012	68.33
50.00	0.000000	0.12	0.50	0.000019	112.07
40.00	0.000000	0.15	0.25	0.000028	162.70
30.00	0.000000	0.19	0.10	0.000035	208.02
20.00	0.000000	0.24			

Females (13-50 years), cont'd.

 Estimated percentile of per-capita days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD	Percentile	Exposure	% aRfD
90.00	0.000000	0.02	10.00	0.000000	0.36
80.00	0.000000	0.04	5.00	0.000000	0.66
70.00	0.000000	0.07	2.50	0.000006	35.66
60.00	0.000000	0.09	1.00	0.000012	68.25
50.00	0.000000	0.12	0.50	0.000019	111.91
40.00	0.000000	0.15	0.25	0.000028	162.51
30.00	0.000000	0.18	0.10	0.000035	207.91
20.00	0.000000	0.24			

Males (20+ years)	Daily Exposure Analysis (mg/kg body-weight/day)	
	per Capita	per User
Mean	0.000000	0.000000
Standard Deviation	0.000003	0.000003
Percent of aRfD	2.57	2.58

     Percent of Person-Days that are User-Days = 99.80%

 Estimated percentile of user-days exceeding calculated exposure
  in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD	Percentile	Exposure	% aRfD
90.00	0.000000	0.03	10.00	0.000000	0.36
80.00	0.000000	0.05	5.00	0.000000	2.27
70.00	0.000000	0.07	2.50	0.000007	38.77
60.00	0.000000	0.09	1.00	0.000011	64.03
50.00	0.000000	0.11	0.50	0.000018	107.43
40.00	0.000000	0.14	0.25	0.000023	137.65
30.00	0.000000	0.18	0.10	0.000031	179.79
20.00	0.000000	0.23			

 Estimated percentile of per-capita days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD	Percentile	Exposure	% aRfD

Appendix 2.   HED Probabilistic Acute Dietary Risk Analysis, Using AMCY RDFs and
DEEM™ Software.

90.00	0.000000	0.03	10.00	0.000000	0.36
80.00	0.000000	0.05	5.00	0.000000	2.27
70.00	0.000000	0.07	2.50	0.000007	38.70
60.00	0.000000	0.09	1.00	0.000011	63.99
50.00	0.000000	0.11	0.50	0.000018	107.34
40.00	0.000000	0.14	0.25	0.000023	137.59
30.00	0.000000	0.18	0.10	0.000031	179.73
20.00	0.000000	0.23			

Appendix 2.   HED Probabilistic Acute Dietary Risk Analysis, Using AMCY RDFs and
DEEM™ Software.

```
Summary calculations:

                95th Percentile     99th Percentile     99.9 Percentile
                Exposure   % aRfD   Exposure   % aRfD   Exposure   % aRfD
                ---------- -------- ---------- -------- ---------- --------
U.S. pop - all seasons:
                0.000001     4.97   0.000018   105.13   0.000068    402.31
All infants (<1 year):
                0.000012    68.78   0.000087   509.52   0.000255   1500.92
Nursing infants (<1 year):
                0.000000     0.46   0.000046   268.53   0.000131    772.51
Non-nursing infants (<1 yr):
                0.000016    94.10   0.000100   585.60   0.000261   1536.45
Children (1-6 years):
                0.000005    29.63   0.000048   280.05   0.000141    829.99
Children (7-12 years):
                0.000001     3.63   0.000023   133.17   0.000068    398.63
Females (13-50 years):
                0.000000     0.66   0.000012    68.25   0.000035    207.91
Males (20+ years):
                0.000000     2.27   0.000011    63.99   0.000031    179.73
```

Appendix 3:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
              Bananas.

```
U.S. Environmental Protection Agency                        Ver. 6.08
DEEM Acute analysis for TERBUFOS                            1989/92 data
Residue file name: C:\DRESSAC\105001m.R91        Adjustment factor #2 NOT used.
Analysis Date 01-05-1999          Residue file dated: 01-04-1999/15:40:20/8
Reference dose (aRfD, Acute) .000017 mg/day
Comment:using MC data files from AmCy
-------------------------------------------------------------------------------
RDF indices and file names for Monte Carlo Analysis
  1  C:\DRESSAC\Swtcorn.rdf

Food Crop                               RESIDUE    RDF  Adj.Factors
Code  Grp  Food Name                     (ppm)      #    #1     #2
----  ----  -------------------------   ----------  ---  ------ ------
 112 A    COFFEE                        000.000280       01.000 01.000
 237 0    CORN/POP                      000.000240       01.000 01.000
 238 0    CORN/SWEET                    000.025000    1  01.000 01.000
 266 0    CORN GRAIN-ENDOSPERM          000.000240       01.000 01.000
 267 0    CORN GRAIN-BRAN               000.000240       01.000 01.000
 268 0    CORN GRAIN/SUGAR/HFCS         000.000240       01.500 01.000
 289 0    CORN GRAIN-OIL                000.000240       01.000 01.000
 388 0    CORN GRAIN/SUGAR-MOLASSES     000.000240       01.500 01.000


U.S. Environmental Protection Agency                        Ver. 6.27
DEEM ACUTE analysis for TERBUFOS                           (1989-92 data)
Residue file name: 105001m.R91                   Adjustment factor #2 NOT used.
Analysis Date: 01-04-1999/17:03:11    Residue file dated: 01-04-1999/15:40:20/8
Acute Reference Dose (aRfD) =   0.000017 mg/kg body-wt/day
MC iterations = 1000      MC list in residue file      MC seed =  1026
Run Comment: using MC data files from AmCy, but not including bananas, plantai
ns, and treating coffee/corn as blended commodities
===============================================================================


U.S. pop - all seasons             Daily Exposure Analysis 1/
---------------------              (mg/kg body-weight/day)
                                    per Capita    per User
                                   -----------   -----------
                Mean                0.000000      0.000000
                Standard Deviation  0.000002      0.000002
                Percent of aRfD        2.38          2.40

        Percent of Person-Days that are User-Days = 99.06%


   Estimated percentile of user-days exceeding calculated exposure
    in mg/kg body-wt/day and corresponding percent of aRfD

   Percentile   Exposure    % aRfD       Percentile   Exposure    % aRfD
   ----------  ----------  ---------     ----------  ----------  ---------
      90.00     0.000000     0.27          10.00      0.000001     4.23
      80.00     0.000000     0.50           5.00      0.000001     6.00
      70.00     0.000000     0.74           2.50      0.000001     8.35
      60.00     0.000000     0.98           1.00      0.000002    14.42
      50.00     0.000000     1.28           0.50      0.000005    31.36
      40.00     0.000000     1.63           0.25      0.000011    61.93
      30.00     0.000000     2.08           0.10      0.000021   125.76
      20.00     0.000000     2.78
```

Appendix 3:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
                Bananas.

Appendix 3: HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
Bananas.

<u>U.S. Population, all seasons (cont'd.)</u>

Estimated percentile of per-capita days exceeding calculated exposure
in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.24		10.00	0.000001	4.21
80.00	0.000000	0.48		5.00	0.000001	5.99
70.00	0.000000	0.72		2.50	0.000001	8.33
60.00	0.000000	0.97		1.00	0.000002	14.38
50.00	0.000000	1.26		0.50	0.000005	31.20
40.00	0.000000	1.62		0.25	0.000010	61.64
30.00	0.000000	2.07		0.10	0.000021	125.36
20.00	0.000000	2.76				

1/ Analysis based on all three-day participant records in CSFII 1989-92 survey.

All infants (<1 year)	Daily Exposure Analysis	
	(mg/kg body-weight/day)	
	per Capita	per User
Mean	0.000000	0.000001
Standard Deviation	0.000002	0.000002
Percent of aRfD	2.60	4.65

Percent of Person-Days that are User-Days = 55.94%

Estimated percentile of user-days exceeding calculated exposure
in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.34		10.00	0.000002	11.06
80.00	0.000000	0.60		5.00	0.000002	12.63
70.00	0.000000	1.40		2.50	0.000002	13.56
60.00	0.000000	1.79		1.00	0.000003	20.40
50.00	0.000000	2.49		0.50	0.000004	23.64
40.00	0.000001	3.55		0.25	0.000006	35.37
30.00	0.000001	5.67		0.10	0.000014	80.73
20.00	0.000001	8.38				

Estimated percentile of per-capita days exceeding calculated exposure
in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000002	8.95
80.00	0.000000	0.00		5.00	0.000002	11.40
70.00	0.000000	0.00		2.50	0.000002	12.82
60.00	0.000000	0.00		1.00	0.000003	16.81
50.00	0.000000	0.36		0.50	0.000004	21.09
40.00	0.000000	1.28		0.25	0.000004	26.13
30.00	0.000000	2.23		0.10	0.000010	56.92

Appendix 3: HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
Bananas.

20. 00   0. 000001   4. 45

Appendix 3:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding Bananas.

```
Nursing infants (<1 year)        Daily Exposure Analysis
-------------------------        (mg/kg body-weight/day)
                                  per Capita    per User
                                 -----------   -----------
            Mean                  0.000000      0.000000
            Standard Deviation    0.000000      0.000001
            Percent of aRfD          0.83          2.23

     Percent of Person-Days that are User-Days = 37.40%
```

Estimated percentile of user-days exceeding calculated exposure
in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD	Percentile	Exposure	% aRfD
90.00	0.000000	1.16	10.00	0.000001	4.20
80.00	0.000000	1.55	5.00	0.000001	4.90
70.00	0.000000	1.60	2.50	0.000001	5.25
60.00	0.000000	1.66	1.00	0.000001	5.45
50.00	0.000000	1.72	0.50	0.000001	5.52
40.00	0.000000	1.77	0.25	0.000001	5.56
30.00	0.000000	2.22	0.10	0.000001	5.78
20.00	0.000000	2.88			

Estimated percentile of per-capita days exceeding calculated exposure
in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD	Percentile	Exposure	% aRfD
90.00	0.000000	0.00	10.00	0.000000	2.43
80.00	0.000000	0.00	5.00	0.000001	3.76
70.00	0.000000	0.00	2.50	0.000001	4.66
60.00	0.000000	0.00	1.00	0.000001	5.22
50.00	0.000000	0.00	0.50	0.000001	5.41
40.00	0.000000	0.00	0.25	0.000001	5.50
30.00	0.000000	1.54	0.10	0.000001	5.56
20.00	0.000000	1.70			

```
Non-nursing infants (<1 yr)      Daily Exposure Analysis
--------------------------       (mg/kg body-weight/day)
                                  per Capita    per User
                                 -----------   -----------
            Mean                  0.000001      0.000001
            Standard Deviation    0.000002      0.000002
            Percent of aRfD          3.35          5.25

     Percent of Person-Days that are User-Days = 63.75%
```

Estimated percentile of user-days exceeding calculated exposure
in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD	Percentile	Exposure	% aRfD

Appendix 3:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding Bananas.

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.34		10.00	0.000002	11.63
80.00	0.000000	0.44		5.00	0.000002	13.05
70.00	0.000000	1.09		2.50	0.000003	15.93
60.00	0.000000	2.17		1.00	0.000004	21.57
50.00	0.000000	2.93		0.50	0.000006	32.66
40.00	0.000001	5.21		0.25	0.000006	36.31
30.00	0.000001	6.81		0.10	0.000018	108.45
20.00	0.000002	9.58				

Non-nursing infants (<1 year), cont'd.

Estimated percentile of per-capita days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000002	10.47
80.00	0.000000	0.00		5.00	0.000002	12.24
70.00	0.000000	0.00		2.50	0.000002	14.29
60.00	0.000000	0.20		1.00	0.000003	19.43
50.00	0.000000	0.54		0.50	0.000004	26.35
40.00	0.000000	1.88		0.25	0.000006	34.23
30.00	0.000001	3.60		0.10	0.000014	81.10
20.00	0.000001	6.59				

Children (1-6 years)	Daily Exposure Analysis (mg/kg body-weight/day)	
	per Capita	per User
Mean	0.000001	0.000001
Standard Deviation	0.000004	0.000004
Percent of aRfD	5.64	5.65

Percent of Person-Days that are User-Days = 99.71%

Estimated percentile of user-days exceeding calculated exposure
 in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.75		10.00	0.000001	8.71
80.00	0.000000	1.48		5.00	0.000002	11.43
70.00	0.000000	2.17		2.50	0.000003	15.38
60.00	0.000000	2.83		1.00	0.000005	31.97
50.00	0.000001	3.55		0.50	0.000016	93.75
40.00	0.000001	4.29		0.25	0.000026	155.38
30.00	0.000001	5.22		0.10	0.000049	286.76
20.00	0.000001	6.52				

Estimated percentile of per-capita days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD

Appendix 3:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
Bananas.

90.00	0.000000	0.73	10.00	0.000001	8.71
80.00	0.000000	1.46	5.00	0.000002	11.43
70.00	0.000000	2.16	2.50	0.000003	15.36
60.00	0.000000	2.82	1.00	0.000005	31.93
50.00	0.000001	3.54	0.50	0.000016	93.57
40.00	0.000001	4.28	0.25	0.000026	155.20
30.00	0.000001	5.21	0.10	0.000049	286.50
20.00	0.000001	6.51			

Appendix 3:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
                 Bananas.

```
Children (7-12 years)              Daily Exposure Analysis
---------------------              (mg/kg body-weight/day)
                                    per Capita    per User
                                   -----------   -----------
               Mean                  0.000001      0.000001
               Standard Deviation    0.000003      0.000003
               Percent of aRfD          4.20          4.21

       Percent of Person-Days that are User-Days = 99.78%
```

```
  Estimated percentile of user-days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD
```

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.75		10.00	0.000001	6.55
80.00	0.000000	1.36		5.00	0.000001	8.31
70.00	0.000000	1.79		2.50	0.000002	10.87
60.00	0.000000	2.23		1.00	0.000004	23.92
50.00	0.000000	2.73		0.50	0.000011	63.93
40.00	0.000001	3.36		0.25	0.000017	101.40
30.00	0.000001	4.04		0.10	0.000033	191.67
20.00	0.000001	4.87				

```
  Estimated percentile of per-capita days exceeding calculated exposure
    in mg/kg body-wt/day and corresponding percent of aRfD
```

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.74		10.00	0.000001	6.54
80.00	0.000000	1.35		5.00	0.000001	8.30
70.00	0.000000	1.79		2.50	0.000002	10.86
60.00	0.000000	2.23		1.00	0.000004	23.90
50.00	0.000000	2.72		0.50	0.000011	63.84
40.00	0.000001	3.36		0.25	0.000017	101.32
30.00	0.000001	4.03		0.10	0.000033	191.54
20.00	0.000001	4.86				

```
Females (13-50 years)              Daily Exposure Analysis
---------------------              (mg/kg body-weight/day)
                                    per Capita    per User
                                   -----------   -----------
               Mean                  0.000000      0.000000
               Standard Deviation    0.000001      0.000001
               Percent of aRfD          1.79          1.80

       Percent of Person-Days that are User-Days = 99.62%
```

```
  Estimated percentile of user-days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD
```

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD

Appendix 3:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding Bananas.

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.21		10.00	0.000001	2.98
80.00	0.000000	0.42		5.00	0.000001	3.98
70.00	0.000000	0.63		2.50	0.000001	5.07
60.00	0.000000	0.85		1.00	0.000001	7.18
50.00	0.000000	1.11		0.50	0.000004	24.10
40.00	0.000000	1.40		0.25	0.000008	45.90
30.00	0.000000	1.73		0.10	0.000016	91.28
20.00	0.000000	2.21				

Females (13-50 years), cont'd.

Estimated percentile of per-capita days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.21		10.00	0.000001	2.98
80.00	0.000000	0.42		5.00	0.000001	3.97
70.00	0.000000	0.63		2.50	0.000001	5.07
60.00	0.000000	0.85		1.00	0.000001	7.17
50.00	0.000000	1.11		0.50	0.000004	24.03
40.00	0.000000	1.39		0.25	0.000008	45.82
30.00	0.000000	1.73		0.10	0.000015	91.16
20.00	0.000000	2.21				

Males (20+ years)	Daily Exposure Analysis (mg/kg body-weight/day)	
	per Capita	per User
Mean	0.000000	0.000000
Standard Deviation	0.000001	0.000001
Percent of aRfD	1.77	1.77

Percent of Person-Days that are User-Days = 99.74%

Estimated percentile of user-days exceeding calculated exposure
 in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.26		10.00	0.000000	2.93
80.00	0.000000	0.47		5.00	0.000001	3.83
70.00	0.000000	0.67		2.50	0.000001	4.79
60.00	0.000000	0.87		1.00	0.000001	7.74
50.00	0.000000	1.08		0.50	0.000004	24.60
40.00	0.000000	1.35		0.25	0.000008	46.59
30.00	0.000000	1.67		0.10	0.000015	86.86
20.00	0.000000	2.12				

Estimated percentile of per-capita days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD

Appendix 3:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
               Bananas.

90. 00	0. 000000	0. 25	10. 00	0. 000000	2. 93
80. 00	0. 000000	0. 46	5. 00	0. 000001	3. 83
70. 00	0. 000000	0. 67	2. 50	0. 000001	4. 79
60. 00	0. 000000	0. 86	1. 00	0. 000001	7. 74
50. 00	0. 000000	1. 08	0. 50	0. 000004	24. 55
40. 00	0. 000000	1. 35	0. 25	0. 000008	46. 53
30. 00	0. 000000	1. 67	0. 10	0. 000015	86. 79
20. 00	0. 000000	2. 12			

Appendix 3:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
Bananas.

```
Summary calculations:

               95th Percentile    99th Percentile    99.9 Percentile
               Exposure   % aRfD  Exposure   % aRfD  Exposure   % aRfD
               ---------- ------- ---------- ------- ---------- -------
U.S. pop - all seasons:
               0.000001    5.99   0.000002   14.38   0.000021   125.36
All infants (<1 year):
               0.000002   11.40   0.000003   16.81   0.000010   56.92
Nursing infants (<1 year):
               0.000001    3.76   0.000001    5.22   0.000001    5.56
Non-nursing infants (<1 yr):
               0.000002   12.24   0.000003   19.43   0.000014   81.10
Children (1-6 years):
               0.000002   11.43   0.000005   31.93   0.000049   286.50
Children (7-12 years):
               0.000001    8.30   0.000004   23.90   0.000033   191.54
Females (13-50 years):
               0.000001    3.97   0.000001    7.17   0.000015   91.16
Males (20+ years):
               0.000001    3.83   0.000001    7.74   0.000015   86.79
```

Appendix 4:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
               Corn.

```
U.S. Environmental Protection Agency                        Ver. 6.08
DEEM Acute analysis for TERBUFOS                            1989/92 data
Residue file name: C:\DRESSAC\105001b.R91      Adjustment factor #2 NOT used.
Analysis Date 01-05-1999           Residue file dated: 01-05-1999/08:30:44/8
Reference dose (aRfD, Acute) .000017 mg/day
Comment:using MC data files from AmCy
-------------------------------------------------------------------------
RDF indices and file names for Monte Carlo Analysis
 1  C:\DRESSAC\Nnftban.rdf

Food Crop                            RESIDUE    RDF  Adj.Factors
Code  Grp  Food Name                 (ppm)       #    #1     #2
----  ----  ------------------------ ---------- ---  ------ ------
 072 A     BANANAS                   000.016000   1  01.000 01.000
 073 A     BANANAS-DRIED             000.016000   1  03.900 01.000
 094 A     PLANTAINS-RIPE            000.016000   1  01.000 01.000
 112 A     COFFEE                    000.000280      01.000 01.000
 378 A     BANANAS-JUICE             000.016000   1  01.000 01.000
 481 A     PLANTAINS-DRIED           000.016000   1  03.900 01.000


U.S. Environmental Protection Agency                        Ver. 6.27
DEEM ACUTE analysis for TERBUFOS                           (1989-92 data)
Residue file name: 105001b.R91                 Adjustment factor #2 NOT used.
Analysis Date: 01-05-1999/09:07:19   Residue file dated: 01-05-1999/08:30:44/8
Acute Reference Dose (aRfD) =   0.000017 mg/kg body-wt/day
MC iterations = 1000      MC list in residue file      MC seed =  1026
Run Comment: using MC data files from AmCy; excluding corn
=============================================================================

U.S. pop - all seasons              Daily Exposure Analysis 1/
----------------------              (mg/kg body-weight/day)
                                     per Capita    per User
                                    -----------  -----------
                  Mean               0.000001     0.000001
                  Standard Deviation 0.000005     0.000007
                  Percent of aRfD       3.37         6.74

       Percent of Person-Days that are User-Days = 49.91%


   Estimated percentile of user-days exceeding calculated exposure
    in mg/kg body-wt/day and corresponding percent of aRfD

    Percentile   Exposure    % aRfD      Percentile   Exposure    % aRfD
    ----------  ----------  ---------    ----------  ----------  ---------
      90.00     0.000000      0.00         10.00     0.000000      0.51
      80.00     0.000000      0.03          5.00     0.000007     41.49
      70.00     0.000000      0.05          2.50     0.000012     73.06
      60.00     0.000000      0.06          1.00     0.000026    155.11
      50.00     0.000000      0.08          0.50     0.000038    223.19
      40.00     0.000000      0.10          0.25     0.000055    321.26
      30.00     0.000000      0.12          0.10     0.000086    505.94
      20.00     0.000000      0.17
```

Appendix 4:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
Corn.

<u>U.S. Population - all season (cont'd.)</u>

  Estimated percentile of per-capita days exceeding calculated exposure
    in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000000	0.17
80.00	0.000000	0.00		5.00	0.000000	0.51
70.00	0.000000	0.00		2.50	0.000007	41.41
60.00	0.000000	0.00		1.00	0.000017	100.22
50.00	0.000000	0.00		0.50	0.000026	155.02
40.00	0.000000	0.03		0.25	0.000038	223.07
30.00	0.000000	0.06		0.10	0.000065	382.39
20.00	0.000000	0.10				

1/ Analysis based on all three-day participant records in CSFII 1989-92 survey.

All infants (<1 year)	Daily Exposure Analysis	
--------------------	(mg/kg body-weight/day)	
	per Capita	per User
	----------	----------
Mean	0.000003	0.000011
Standard Deviation	0.000017	0.000032
Percent of aRfD	16.60	65.37

        Percent of Person-Days that are User-Days = 25.40%

  Estimated percentile of user-days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000040	234.10
80.00	0.000000	0.00		5.00	0.000079	463.17
70.00	0.000000	0.00		2.50	0.000090	527.01
60.00	0.000000	0.00		1.00	0.000166	974.96
50.00	0.000000	0.00		0.50	0.000244	1436.45
40.00	0.000000	0.00		0.25	0.000267	1572.82
30.00	0.000001	6.41		0.10	0.000281	1653.26
20.00	0.000006	33.47				

  Estimated percentile of per-capita days exceeding calculated exposure
    in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000000	0.40
80.00	0.000000	0.00		5.00	0.000007	39.79
70.00	0.000000	0.00		2.50	0.000041	241.33
60.00	0.000000	0.00		1.00	0.000083	490.32
50.00	0.000000	0.00		0.50	0.000117	685.74
40.00	0.000000	0.00		0.25	0.000168	989.51
30.00	0.000000	0.00		0.10	0.000254	1494.44

Appendix 4:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding Corn.

20. 00   0. 000000   0. 00

Appendix 4:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
Corn.

```
Nursing infants (<1 year)          Daily Exposure Analysis
------------------------           (mg/kg body-weight/day)
                                    per Capita    per User
                                   -----------   -----------
              Mean                   0.000001      0.000013
              Standard Deviation     0.000009      0.000026
              Percent of aRfD          7.78         73.87

      Percent of Person-Days that are User-Days = 10.53%
```

Estimated percentile of user-days exceeding calculated exposure
in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000041	240.19
80.00	0.000000	0.00		5.00	0.000043	251.52
70.00	0.000000	0.00		2.50	0.000118	691.39
60.00	0.000000	0.00		1.00	0.000126	742.44
50.00	0.000000	0.00		0.50	0.000129	759.46
40.00	0.000000	0.00		0.25	0.000131	767.96
30.00	0.000000	0.00		0.10	0.000131	773.07
20.00	0.000036	210.01				

Estimated percentile of per-capita days exceeding calculated exposure
in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000000	0.00
80.00	0.000000	0.00		5.00	0.000000	0.00
70.00	0.000000	0.00		2.50	0.000022	131.34
60.00	0.000000	0.00		1.00	0.000041	241.32
50.00	0.000000	0.00		0.50	0.000050	295.64
40.00	0.000000	0.00		0.25	0.000118	695.66
30.00	0.000000	0.00		0.10	0.000127	744.15
20.00	0.000000	0.00				

```
Non-nursing infants (<1 yr)        Daily Exposure Analysis
--------------------------         (mg/kg body-weight/day)
                                    per Capita    per User
                                   -----------   -----------
              Mean                   0.000003      0.000011
              Standard Deviation     0.000019      0.000033
              Percent of aRfD         20.32         64.18

      Percent of Person-Days that are User-Days = 31.66%
```

Estimated percentile of user-days exceeding calculated exposure
in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD

Appendix 4:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
Corn.

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000031	181.26
80.00	0.000000	0.00		5.00	0.000079	462.36
70.00	0.000000	0.00		2.50	0.000088	517.62
60.00	0.000000	0.00		1.00	0.000176	1037.50
50.00	0.000000	0.00		0.50	0.000247	1451.44
40.00	0.000000	0.00		0.25	0.000267	1572.47
30.00	0.000001	7.26		0.10	0.000280	1645.08
20.00	0.000005	26.54				

Non-nursing infants (<1 year), cont'd.

  Estimated percentile of per-capita days exceeding calculated exposure
    in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000001	6.11
80.00	0.000000	0.00		5.00	0.000016	91.63
70.00	0.000000	0.00		2.50	0.000051	299.52
60.00	0.000000	0.00		1.00	0.000086	503.06
50.00	0.000000	0.00		0.50	0.000142	836.72
40.00	0.000000	0.00		0.25	0.000206	1211.65
30.00	0.000000	0.00		0.10	0.000262	1540.59
20.00	0.000000	0.00				

Children (1-6 years)	Daily Exposure Analysis (mg/kg body-weight/day)	
	per Capita	per User
Mean	0.000002	0.000008
Standard Deviation	0.000010	0.000022
Percent of aRfD	9.19	48.12

     Percent of Person-Days that are User-Days = 19.10%

  Estimated percentile of user-days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000029	173.29
80.00	0.000000	0.00		5.00	0.000046	271.24
70.00	0.000000	0.00		2.50	0.000072	425.02
60.00	0.000000	0.00		1.00	0.000109	641.94
50.00	0.000000	0.00		0.50	0.000134	788.51
40.00	0.000000	0.00		0.25	0.000160	939.80
30.00	0.000000	0.00		0.10	0.000220	1294.28
20.00	0.000008	44.55				

  Estimated percentile of per-capita days exceeding calculated exposure
    in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD

Appendix 4: HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding Corn.

----------	----------	---------		----------	----------	---------
90.00	0.000000	0.00		10.00	0.000000	0.00
80.00	0.000000	0.00		5.00	0.000003	17.04
70.00	0.000000	0.00		2.50	0.000023	133.55
60.00	0.000000	0.00		1.00	0.000045	266.64
50.00	0.000000	0.00		0.50	0.000071	417.80
40.00	0.000000	0.00		0.25	0.000102	597.30
30.00	0.000000	0.00		0.10	0.000133	781.62
20.00	0.000000	0.00				

Appendix 4:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
              Corn.

```
Children (7-12 years)              Daily Exposure Analysis
---------------------              (mg/kg body-weight/day)
                                    per Capita    per User
                                   -----------   -----------
              Mean                   0.000001      0.000004
              Standard Deviation     0.000005      0.000011
              Percent of aRfD           3.68         23.01

        Percent of Person-Days that are User-Days = 16.01%
```

```
  Estimated percentile of user-days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD

  Percentile   Exposure     % aRfD          Percentile   Exposure     % aRfD
  ----------  ----------   ---------        ----------  ----------   ---------
    90.00     0.000000      0.00              10.00     0.000015      90.87
    80.00     0.000000      0.00               5.00     0.000024     138.42
    70.00     0.000000      0.00               2.50     0.000034     201.40
    60.00     0.000000      0.00               1.00     0.000054     317.80
    50.00     0.000000      0.00               0.50     0.000064     376.27
    40.00     0.000000      0.00               0.25     0.000083     490.81
    30.00     0.000000      0.10               0.10     0.000098     574.29
    20.00     0.000002     10.59
```

```
  Estimated percentile of per-capita days exceeding calculated exposure
    in mg/kg body-wt/day and corresponding percent of aRfD

  Percentile   Exposure     % aRfD          Percentile   Exposure     % aRfD
  ----------  ----------   ---------        ----------  ----------   ---------
    90.00     0.000000      0.00              10.00     0.000000      0.00
    80.00     0.000000      0.00               5.00     0.000000      0.09
    70.00     0.000000      0.00               2.50     0.000008     45.80
    60.00     0.000000      0.00               1.00     0.000022    126.57
    50.00     0.000000      0.00               0.50     0.000032    185.71
    40.00     0.000000      0.00               0.25     0.000047    274.23
    30.00     0.000000      0.00               0.10     0.000061    361.70
    20.00     0.000000      0.00
```

```
Females (13-50 years)              Daily Exposure Analysis
---------------------              (mg/kg body-weight/day)
                                    per Capita    per User
                                   -----------   -----------
              Mean                   0.000000      0.000001
              Standard Deviation     0.000002      0.000004
              Percent of aRfD           2.04          4.37

        Percent of Person-Days that are User-Days = 46.73%
```

```
  Estimated percentile of user-days exceeding calculated exposure
   in mg/kg body-wt/day and corresponding percent of aRfD

  Percentile   Exposure     % aRfD          Percentile   Exposure     % aRfD
  ----------  ----------   ---------        ----------  ----------   ---------
```

Appendix 4:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding
Corn.

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000000	0.46
80.00	0.000000	0.04		5.00	0.000005	29.85
70.00	0.000000	0.05		2.50	0.000010	59.11
60.00	0.000000	0.06		1.00	0.000018	106.88
50.00	0.000000	0.08		0.50	0.000026	154.07
40.00	0.000000	0.11		0.25	0.000032	188.40
30.00	0.000000	0.14		0.10	0.000042	245.24
20.00	0.000000	0.19				

Females (13-50 years), cont'd.

Estimated percentile of per-capita days exceeding calculated exposure
in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.00		10.00	0.000000	0.18
80.00	0.000000	0.00		5.00	0.000000	0.44
70.00	0.000000	0.00		2.50	0.000005	27.79
60.00	0.000000	0.00		1.00	0.000012	70.58
50.00	0.000000	0.00		0.50	0.000018	104.65
40.00	0.000000	0.02		0.25	0.000026	150.77
30.00	0.000000	0.06		0.10	0.000034	202.05
20.00	0.000000	0.10				

Males (20+ years)	Daily Exposure Analysis	
	(mg/kg body-weight/day)	
	per Capita	per User
Mean	0.000000	0.000001
Standard Deviation	0.000002	0.000003
Percent of aRfD	2.10	3.26

Percent of Person-Days that are User-Days = 64.49%

Estimated percentile of user-days exceeding calculated exposure
in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD
90.00	0.000000	0.03		10.00	0.000000	0.28
80.00	0.000000	0.04		5.00	0.000003	20.08
70.00	0.000000	0.05		2.50	0.000008	44.30
60.00	0.000000	0.06		1.00	0.000014	82.88
50.00	0.000000	0.08		0.50	0.000020	119.64
40.00	0.000000	0.09		0.25	0.000025	145.71
30.00	0.000000	0.12		0.10	0.000031	181.80
20.00	0.000000	0.16				

Estimated percentile of per-capita days exceeding calculated exposure
in mg/kg body-wt/day and corresponding percent of aRfD

Percentile	Exposure	% aRfD		Percentile	Exposure	% aRfD

Appendix 4:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding Corn.

90. 00	0. 000000	0. 00	10. 00	0. 000000	0. 21
80. 00	0. 000000	0. 00	5. 00	0. 000002	9. 18
70. 00	0. 000000	0. 00	2. 50	0. 000005	30. 97
60. 00	0. 000000	0. 02	1. 00	0. 000012	68. 72
50. 00	0. 000000	0. 04	0. 50	0. 000017	99. 40
40. 00	0. 000000	0. 06	0. 25	0. 000022	131. 35
30. 00	0. 000000	0. 08	0. 10	0. 000029	168. 55
20. 00	0. 000000	0. 11			

Appendix 4:   HED Probabilistic Acute Dietary Risk Analysis Using AMCY RDFs, Excluding Corn.

```
Summary calculations:

                  95th Percentile     99th Percentile     99.9 Percentile
                  Exposure   % aRfD   Exposure   % aRfD   Exposure   % aRfD
                  ---------- -------- ---------- -------- ---------- --------
U.S. pop - all seasons:
                  0.000000    0.51    0.000017   100.22   0.000065   382.39
All infants (<1 year):
                  0.000007   39.79    0.000083   490.32   0.000254  1494.44
Nursing infants (<1 year):
                  0.000000    0.00    0.000041   241.32   0.000127   744.15
Non-nursing infants (<1 yr):
                  0.000016   91.63    0.000086   503.06   0.000262  1540.59
Children (1-6 years):
                  0.000003   17.04    0.000045   266.64   0.000133   781.62
Children (7-12 years):
                  0.000000    0.09    0.000022   126.57   0.000061   361.70
Females (13-50 years):
                  0.000000    0.44    0.000012    70.58   0.000034   202.05
Males (20+ years):
                  0.000002    9.18    0.000012    68.72   0.000029   168.55
```

Appendix 5:   HED Revised Chronic Dietary Risk Analysis Using AMCY Anticipated Residues.

```
U.S. Environmental Protection Agency                       Ver. 6.12
DEEM89N CHRONIC analysis for TERBUFOS                      (1989-92 data)
Residue file name: 105001TE                    Adjustment factor #2 used.
Analysis Date 01-14-1999          Residue file dated: 01-14-1999/11:24:03/8
Reference dose (RfD, CHRONIC) =   0.000017 mg/kg body-wt/day
COMMENT 1: UF of 100 includes 10X for intra-, 10X for inter-; FQPA SF = 3
COMMENT 2: Using AMCY ARs, BEAD %CT (except bananas), and DEEM default Conc.
==============================================================================
                        Residue file listing
------------------------------------------------------------------------------
Food    EPA    Crop                              Residue  Adj. Fctrs
Code    Code   Group  Food Name                   (ppm)    #1    #2
----  --------  ----  ------------------------  ---------- ----- -----
  72  06002AB    A    BANANAS                    0.007000  1.00  0.28
  73  06002DA    A    BANANAS-DRIED              0.007000  3.90  0.28
  94  06016AA    A    PLANTAINS-RIPE             0.007000  1.00  0.28
 112  07002AA    A    COFFEE                     0.028000  1.00  0.01
 237  15004AA    0    CORN/POP                   0.003000  1.00  0.11
 238  15005AA    0    CORN/SWEET                 0.006000  1.00  0.09
 266  24002EA    0    CORN GRAIN-ENDOSPERM       0.003000  1.00  0.11
 267  24002HA    0    CORN GRAIN-BRAN            0.003000  1.00  0.11
 268  24002SA    0    CORN GRAIN/SUGAR/HFCS      0.003000  1.50  0.11
 289  270020A    0    CORN GRAIN-OIL             0.003000  1.00  0.11
 378  06002NA    A    BANANAS-JUICE              0.007000  1.00  0.28
 388  24002MO    0    CORN GRAIN/SUGAR-MOLASSES  0.003000  1.50  0.11
 480  06016GA    A    PLANTAINS-GREEN            0.007000  1.00  0.28
 481  06016DA    A    PLANTAINS-DRIED            0.007000  3.90  0.28
```

Appendix 5:   HED Revised Chronic Dietary Risk Analysis Using AMCY Anticipated Residues.

```
U.S. Environmental Protection Agency                        Ver. 6.12
DEEM89N CHRONIC analysis for TERBUFOS                      (1989-92 data)
Residue file name: 105001TE                        Adjustment factor #2 used.
Analysis Date 01-14-1999          Residue file dated: 01-14-1999/11:24:03/8
Reference dose (RfD, CHRONIC) =   0.000017 mg/kg body-wt/day
COMMENT 1: UF of 100 includes 10X for intra-, 10X for inter-; FQPA SF = 3
COMMENT 2: Using AMCY ARs, BEAD %CT (except bananas), and DEEM default Conc.
===============================================================================
                    Total exposure by population subgroup
-------------------------------------------------------------------------------
```

| | Total Exposure | |
Population Subgroup	mg/kg body wt/day	Percent of Rfd
U.S. Pop - 48 states - all seasons	0.000001	6.6%
U.S. Population - spring season	0.000001	6.6%
U.S. Population - summer season	0.000001	6.4%
U.S. Population - autumn season	0.000001	6.4%
U.S. Population - winter season	0.000001	7.2%
Northeast region	0.000001	6.2%
Midwest region	0.000001	6.5%
Southern region	0.000001	7.1%
Western region	0.000001	6.5%
Pacific Region	0.000001	6.3%
Hispanics	0.000001	7.2%
Non-hispanic whites	0.000001	6.6%
Non-hispanic blacks	0.000001	6.2%
Non-hispanic other than black or white	0.000001	8.1%
All infants (<1 year)	0.000004	21.0%
Nursing infants (<1 year)	0.000002	9.2%
Non-nursing infants (<1 year)	0.000004	26.0%
Children (1-6 years)	0.000003	17.1%
Children (7-12 years)	0.000002	9.5%
Females (13-19 yrs/not preg. or nursing)	0.000001	4.6%
Females (20+ years/not preg. or nursing)	0.000001	4.9%
Females (13-50 years)	0.000001	4.5%
Females (13+/pregnant/not nursing)	0.000001	5.2%
Females (13+/nursing)	0.000001	6.3%
Males (13-19 years)	0.000001	6.4%
Males (20+ years)	0.000001	4.5%
Seniors (55+)	0.000001	5.8%

Appendix 5:   HED Revised Chronic Dietary Risk Analysis Using AMCY Anticipated Residues.

U.S. Environmental Protection Agency
  Ver. 6.12
DEEM89N CHRONIC analysis for TERBUFOS
(1989-92 data)
Residue file name: 105001TE   Adjustment
factor #2 used.
Analysis Date 01-14-1999   Residue file dated:
01-14-1999/11:24:03/8
Reference dose (RfD, CHRONIC) =   0.000017 mg/kg body-wt/day
COMMENT 1: UF of 100 includes 10X for intra-, 10X for inter-;
FQPA SF = 3
COMMENT 2: Using AMCY ARs, BEAD %CT (except bananas), and DEEM
default Conc.
==
==============
              Critical Commodity Contribution Analysis for
                  U.S. Pop - 48 states - all seasons

              Total Exposure = 0.0000011 mg/kg-body wt/DAY

         Crop groups with total exposure contribution > 10%
            Foods/Foodforms with exposure contribution > 10%

Crop group   ---------Exposure
Analysis-------
    Food   mg/kg   % of Total
Percent
        Foodform   body wt/day   Exposure
of RfD
-------------------------------------- ----------- ----------
----

GROUP UNSPECIFIED
    BANANAS   0.0000006   49.22%
    3.27%
-------------------------------------- ----------- ----------
----
  Total for crop group   0.0000006   52.83%
    3.51%

Appendix 5:   HED Revised Chronic Dietary Risk Analysis Using AMCY Anticipated Residues.

```
CEREAL GRAINS
   CORN/SWEET                                0.0000001      10.23%
   0.68%
   CORN GRAIN/SUGAR/HFCS                     0.0000003      29.13%
   1.93%
-------------------------------------    ----------    ----------
---------
  Total for crop group                      0.0000005      47.17%
   3.13%

Total for crop groups listed above:        0.0000011     100.00%
   6.64%
-----------------------------------------------------------------
--------------
```

                    Critical Commodity Contribution Analysis for
                              All infants (<1 year)

                    Total Exposure = 0.0000036 mg/kg-body wt/DAY

                 Crop groups with total exposure contribution > 10%
                    Foods/Foodforms with exposure contribution > 10%
```
-----------------------------------------------------------------
--------------
```

Crop group		
Analysis-------	---------Exposure	
Food	mg/kg	% of Total
Percent		
Foodform	body wt/day	Exposure
of RfD		

```
-------------------------------------    ----------    ----------
---------

GROUP UNSPECIFIED
   BANANAS                                   0.0000025      69.73%
   14.67%
   BANANAS-DRIED                             0.0000004      10.89%
   2.29%
-------------------------------------    ----------    ----------
```

Appendix 5:   HED Revised Chronic Dietary Risk Analysis Using AMCY Anticipated Residues.


```
---------
  Total for crop group                      0.0000030     83.17%
  17.49%


CEREAL GRAINS
  CORN GRAIN/SUGAR/HFCS                      0.0000005     14.54%
  3.06%
-------------------------------------    ----------    ----------
---------
  Total for crop group                      0.0000006     16.83%
  3.54%

Total for crop groups listed above:        0.0000036    100.00%
  21.03%
-----------------------------------------------------------------
-------------
```


                   Critical Commodity Contribution Analysis for
                            Nursing infants (<1 year)

                   Total Exposure = 0.0000016 mg/kg-body wt/DAY

                   Crop groups with total exposure contribution > 10%
                      Foods/Foodforms with exposure contribution > 10%

```
-----------------------------------------------------------------
-------------
```

Crop group	---------Exposure Analysis-------	
Food Percent	mg/kg	% of Total
Foodform of RfD	body wt/day	Exposure

```
-------------------------------------    ----------    ----------
---------
```

GROUP UNSPECIFIED

BANANAS 1.28%	0.0000002	13.99%
BANANAS-DRIED	0.0000011	72.96%

Appendix 5:   HED Revised Chronic Dietary Risk Analysis Using AMCY Anticipated Residues.

```
     6. 69%
-----------------------------------    ----------    ---------
---------
   Total for crop group                  0. 0000014    87. 59%
     8. 03%


CEREAL GRAINS
   CORN GRAIN/SUGAR/HFCS                  0. 0000002    11. 52%
     1. 06%
-----------------------------------    ----------    ---------
---------
   Total for crop group                  0. 0000002    12. 41%
     1. 14%


Total for crop groups listed above:     0. 0000016   100. 00%
     9. 17%
-----------------------------------------------------------------
--------------


             Critical Commodity Contribution Analysis for
                    Non-nursing infants (<1 year)

             Total Exposure =   0. 0000044 mg/kg-body wt/DAY

          Crop groups with total exposure contribution > 10%
             Foods/Foodforms with exposure contribution > 10%
-----------------------------------------------------------------
--------------

Crop group                          ---------Exposure
Analysis-------
   Food                               mg/kg      % of Total
Percent
     Foodform                        body wt/day    Exposure
of RfD
-----------------------------------    ----------    ---------
---------


GROUP UNSPECIFIED
   BANANAS                               0. 0000035    78. 00%
     20. 30%
```

Appendix 5:   HED Revised Chronic Dietary Risk Analysis Using AMCY Anticipated Residues.

```
---------------------------------------  -----------  ----------
---------
   Total for crop group                  0.0000037     82.51%
   21.47%

CEREAL GRAINS
   CORN GRAIN/SUGAR/HFCS                  0.0000007     14.99%
   3.90%
---------------------------------------  -----------  ----------
---------
   Total for crop group                  0.0000008     17.49%
   4.55%

Total for crop groups listed above:      0.0000044    100.00%
   26.02%
-----------------------------------------------------------------
--------------
```

Appendix 5:   HED Revised Chronic Dietary Risk Analysis Using AMCY Anticipated Residues.

Critical Commodity Contribution Analysis for Children (1-6 years)

Total Exposure = 0.0000029 mg/kg-body wt/DAY

Crop groups with total exposure contribution > 10%
Foods/Foodforms with exposure contribution > 10%

| Crop group
Analysis------- | ----------Exposure | |
| Food
Percent | mg/kg | % of Total |
Foodform of RfD	body wt/day	Exposure
GROUP UNSPECIFIED		
BANANAS 9.08%	0.0000015	53.04%
Total for crop group 9.58%	0.0000016	55.98%
CEREAL GRAINS		
CORN/SWEET 1.78%	0.0000003	10.40%
CORN GRAIN/SUGAR/HFCS 4.63%	0.0000008	27.07%
Total for crop group 7.53%	0.0000013	44.02%
Total for crop groups listed above: 17.11%	0.0000029	100.00%

Appendix 5:   HED Revised Chronic Dietary Risk Analysis Using AMCY Anticipated Residues.

```
                Critical Commodity Contribution Analysis for
                          Children (7-12 years)

               Total Exposure =  0.0000016 mg/kg-body wt/DAY

             Crop groups with total exposure contribution > 10%
               Foods/Foodforms with exposure contribution > 10%
------------------------------------------------------------------
--------------


Crop group                                 ----------Exposure
Analysis-------
   Food                                     mg/kg      % of Total
Percent
      Foodform                             body wt/day   Exposure
of RfD
----------------------------------------   ----------  ----------
---------


GROUP UNSPECIFIED
   BANANAS                                 0.0000006     37.83%
   3.58%
----------------------------------------   ----------  ----------
---------
   Total for crop group                    0.0000007     40.51%
   3.83%

CEREAL GRAINS
   CORN/SWEET                              0.0000002     12.64%
   1.20%
   CORN GRAIN/SUGAR/HFCS                   0.0000006     37.34%
   3.53%
----------------------------------------   ----------  ----------
---------
   Total for crop group                    0.0000010     59.49%
   5.63%

Total for crop groups listed above:        0.0000016    100.00%
   9.46%
------------------------------------------------------------------
--------------
```

Appendix 5:   HED Revised Chronic Dietary Risk Analysis Using AMCY Anticipated Residues.

Appendix 5:   HED Revised Chronic Dietary Risk Analysis Using AMCY Anticipated Residues.

```
               Critical Commodity Contribution Analysis for
                           Females (13-50 years)

               Total Exposure =  0.0000008 mg/kg-body wt/DAY

            Crop groups with total exposure contribution > 10%
              Foods/Foodforms with exposure contribution > 10%
-----------------------------------------------------------------
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Crop group                               ---------Exposure
Analysis-------
    Food                                  mg/kg       % of Total
Percent
       Foodform                          body wt/day   Exposure
of RfD
---------------------------------------  ----------  ----------
---------


GROUP UNSPECIFIED
   BANANAS                                0.0000003     44.14%
   1.97%
---------------------------------------  ----------  ----------
---------
  Total for crop group                    0.0000004     47.59%
   2.13%

CEREAL GRAINS
   CORN/SWEET                             0.0000001     11.13%
   0.50%
   CORN GRAIN/SUGAR/HFCS                  0.0000002     32.73%
   1.46%
---------------------------------------  ----------  ----------
---------
  Total for crop group                    0.0000004     52.41%
   2.34%

Total for crop groups listed above:      0.0000008    100.00%
    4.47%
-----------------------------------------------------------------
--------------
```

Appendix 5:   HED Revised Chronic Dietary Risk Analysis Using AMCY Anticipated Residues.

Critical Commodity Contribution Analysis for Males (20+ years)

Total Exposure = 0.0000008 mg/kg-body wt/DAY

Crop groups with total exposure contribution > 10%
Foods/Foodforms with exposure contribution > 10%

```
------------------------------------------------------------------
--------------
```

Crop group Analysis-------	---------Exposure	
Food Percent	mg/kg	% of Total
Foodform of RfD	body wt/day	Exposure

```
---------------------------------------  ----------  ----------
---------
```

GROUP UNSPECIFIED			
BANANAS	0.0000003	45.36%	
2.03%			

```
---------------------------------------  ----------  ----------
---------
```

Total for crop group	0.0000004	48.79%
2.18%		

CEREAL GRAINS		
CORN/SWEET	0.0000001	11.09%
0.50%		
CORN GRAIN/SUGAR/HFCS	0.0000002	30.08%
1.34%		

```
---------------------------------------  ----------  ----------
---------
```

Total for crop group	0.0000004	51.21%
2.29%		

Total for crop groups listed above:	0.0000008	100.00%
4.47%		

```
------------------------------------------------------------------
--------------
```

Appendix 5:   HED Revised Chronic Dietary Risk Analysis Using AMCY Anticipated Residues.